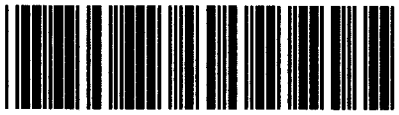
Control Number: 32182



Item Number: 215

Addendum StartPage: 0

Debra L. Anderson
Director, Regulatory Affairs

ONCOR

Oncor Electric Delivery
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December 1, 2008

Mr. David Featherston
Director, Infrastructure & Reliability Division
Public Utility Commission of Texas
1701 North Congress Avenue
Austin, Texas 78711

Subject: Project No. 32182 – "*PUC Investigation of Methods to Improve Electric and Telecommunications Infrastructure to Minimize Long Term Outages and Restoration Costs Associated with Gulf Coast Hurricanes*"

Dear Mr. Featherston:

Oncor Electric Delivery LLC ("Oncor") files the attached summary of our activities related to the below three items, including a description of our normal vegetation management and inspection cycles, as requested under Project No. 32182.

1) Vegetation management program for overhead facilities;
2) On-going cyclical, ground-based inspection program for overhead facilities; and,
3) Inventories of Electric Utilities' Transmission Lines within Fifty Miles of the Texas Coast (Not applicable to Oncor.)

Please find attached responses, as well as two internal-use documents that further outline Oncor's vegetation management program, for both its distribution and transmission infrastructure.

If you need any further information, please contact me at 214-486-2879.

Sincerely,

Debra L Anderson

Enclosures

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1. Vegetation Management Program for Overhead Facilities

Distribution

In general, Oncor Electric Delivery considers numerous factors to determine when an overhead distribution circuit needs vegetation clearing or trimming such as safety concerns, inspections, outages, storm damage, circuit performance and reliability. Distribution feeder performance data (e.g., outage restoration data), reliability indices, and visual information are gathered, monitored and analyzed on an ongoing basis to assess the impact of vegetation and determine the appropriate amount, location, and timing of vegetation management for each feeder. Field operations employees clear or trim vegetation in a specific or local area as appropriate in the performance of their normal maintenance and/or construction duties.

Oncor Electric Delivery distribution operations employees perform visual inspections of the distribution system constantly as they go about their normal everyday duties working on or operating the distribution system, rather than performing visual inspections of the entire distribution system on a specific cycle. All employees and contractors in the normal course of their work activities are instructed to report any anomalies observed on the distribution system so that appropriate action can be taken. Aerial observation is generally not utilized to inspect the distribution system.

Oncor Electric Delivery has over 100,000 miles of distribution circuits, extending over a wide area of Texas that are exposed to a wide variety of vegetation conditions. For example, feeders in rural East Texas require more and different vegetation management activity than feeders in far West Texas. Therefore, the Company utilizes the collection of reliability data and monitoring of the performance of the Company's feeders in order that the Company can cost effectively and proactively direct and perform appropriate vegetation management activities. In addition, Vegetation Management is an integral part of other larger scale maintenance programs initiated by Oncor such as the Comprehensive Maintenance Program and Open Wire Secondary Program, in which comprehensive trimming on those feeders or sections of feeders where these programs are initiated takes place.

Transmission

Oncor Electric Delivery considers numerous factors to determine when an area or an entire circuit requires vegetation clearing or trimming, such as safety concerns, access requirements, inspections, outages, storm damage, circuit performance, reliability and serving new loads. In addition, Oncor has participated on industry comments regarding the NERC VM standards, adopted the standard (FAC 003-1) and continues to stay abreast of industry changes regarding the interpretation of the standard.

Oncor Electric Delivery has several operational and maintenance practices that result in an effective vegetation management program. The following is a listing of some of the ongoing specific practices that have been instituted over the years.

a. Scheduled Fixed-Wing Aerial Patrols - Scheduled semi-annual aerial patrols of transmission lines (one scheduled just prior to summer peak) are performed by experienced pilots that report problems with transmission structures, insulators, and conductors along with locations where vegetation might cause problems when line loading increases result in additional sagging of conductors. Special emphasis is placed on vegetation growth during the late spring patrol.

b. Scheduled Helicopter Aerial Patrols - Scheduled semi-annual patrols of transmission lines in the DFW Metroplex (one scheduled just prior to summer peak) are performed with company personnel aboard focusing on the same issues mentioned in the previous paragraph. This patrol is used in areas that cannot be accessed by fixed-wing aircraft.

c. Special and Follow-up Land Patrols - Since the fixed-winged aerial patrols may not capture the level of detail Oncor requires to ensure vegetation is under control, each district reviews by land patrol those areas where vegetation/trees are known to be a potential problem. The level of land patrol varies depending on the vegetation associated with various district/geographic areas. Additionally, during years with unusually high rainfall, special inspections are conducted on creek, lake bank, marsh, and fence crossings.

d. Meetings on Vegetation Management of Transmission ROW - Each district conducts meetings at least twice each year (three times in rural districts with highly vegetated ROW) in the administration of programs for ROW herbicide treatment, ROW tree trimming, and ROW mowing. Intervals for these vegetation control practices are set based on district patrol observations for each transmission line. The district helps to prioritize the work of Vegetation Management crews that patrol and remove off-ROW "danger trees" (dead trees that might fall toward the transmission line). This ensures that adequate resources (company and contract personnel) along with the funding necessary are dedicated to address possible problem areas on the ROW.

e. Summer and Winter Preparedness Effort - Special aerial patrols (helicopter or fixed-wing) and/or walking/driving inspections of all bulk power (345 kV) lines and critical 138 kV lines are conducted prior to summer peak looking for ROW encroachments, high vegetation, and ROW or equipment problems (e.g. tower/pole footing erosion, damaged structures, insulator damage, suspension hardware trouble). Specific walking patrols of critical lines (as identified by studies performed by the Asset Management planning group) are also conducted in association with preparing for summer peak loads.

f. Contingency Mitigation Practice - During contingency studies, the company's Asset Management planning group identifies critical lines that should be monitored under emergency loading caused by unexpected contingencies. The Transmission districts identify locations on those specific transmission lines and

create plans to monitor conductor temperatures (using infrared cameras) and ground clearances during emergency loading conditions.

g. Periodic ROW mowing and substation maintenance in support of various municipal ordinances.

2. Ground-based Inspections Program for Overhead Facilities

Distribution

Oncor Electric Delivery employs several initiatives, rather than a singular specific program, to address the ground-based inspection of its overhead facilities. These initiatives include the following:

a. Field line personnel working on or inspecting the overhead lines in the normal course of business will conduct informal inspections during these typical work assignments. Though these inspections are not formally documented, a work request, email or phone call will be initiated to perform any maintenance work identified. These field line personnel can be Oncor Electric Delivery personnel or contractors working in/as first responder roles, repair crews, installation crews, designers and even meter readers in some cases.

b. Every Company feeder is assigned to a Distribution Operating Technician that has the responsibility to monitor that feeder on a continuous basis. In addition, other Company personnel directly involved with the design, construction, and maintenance of the electric system are also trained to identify, report, or correct potential problems that they may encounter while performing routine activities.

In addition to the previously mentioned initiatives, there are documented inspections which occur in several of Oncor Electric Delivery's more formalized programs on a periodic basis. These programs include:

a. Pole Maintenance Program - The contractor performing the ground-line inspection also performs a detailed visual inspection of the pole and a cursory inspection of the overhead facilities.

b. Planned Feeder Maintenance Program (PFMP) - Contract or distribution operation technicians visually inspect all or major portions of the worst performing feeders identifying targeted maintenance items to improve the feeder performance. This is performed annually on ten percent of the feeders.

c. Comprehensive Overhead Maintenance Program (COMP) - Contract or Distribution Operation Technicians visually inspect overhead portions of a feeder identifying required maintenance items to improve those targeted feeders' performance.

d. Wood Pin Replacement Program - Contract inspectors visually inspect the entire overhead feeder recommending wood pin and cross arm replacements required to improve those targeted feeders' performance.

e. Open Wire Secondary Replacement Program - Distribution Operation Technicians target specific types of problematic secondary for replacement.

f. Capacitor Inspections - Distribution Operation Technicians visually inspect all of the overhead capacitor banks and controls on a periodic basis.

Transmission

Oncor Electric Delivery employs several initiatives as a part of its ground-based inspection of its overhead facilities. These initiatives include the following:

a. Transmission line aerial inspections are completed semi-annually via a fixed-winged aircraft on all Oncor transmission lines where there are no Federal Aviation Administration (FAA) air restrictions. For those transmission lines subjected to air restrictions, transmission line ground-base inspections or helicopter-based inspections are performed on an annual basis. Additional "off-cycle" aerial inspections are completed throughout the year based on system performance.

b. Pole Maintenance Program – A contractor is employed to perform ground-line inspection and treatment of transmission wood poles on all wood-pole lines on average over a 10 year cycle (more frequently in the wet areas of the service area and less frequently in the dry areas). During this inspection, the contractor performs a detailed visual inspection of the pole and a cursory inspection of the overhead facilities. The pole is treated at the ground-line with a preservative that protects the pole from rot and insect infestation. Poles that are questionable are reported and placed on a list for replacement or stubbing, as appropriate.

c. Road Crossing Inspections - Patrol personnel also conduct informal inspections at road crossings during routine patrols of stations looking for encroachments and vegetation growth as well as for any facility abnormalities at these locations.

d. Ground based Inspections - Personnel perform ground-based inspections of wood pole lines at varying frequencies as determined based on several factors such as recent findings on aerial patrols, contract ground-line inspection findings (rejected, abnormalities found), the age of the poles on the line, vegetation growth rate in the area, etc. Transmission line ground-base inspections are completed on a frequency of 60-months for non-wood structure transmission lines, 24 months for wood structure transmission lines less than 15 years in age, and 12 months for wood structure transmission lines greater than 15 years in age. Additional "off-cycle" inspections are completed during construction or system operation activities, as part of substation inspection processes, or based upon system performance. These ground-based inspections are intended to find

abnormalities with structures, conductors, and ROW conditions that would be detrimental to the operation of the line.

e. Wood Pole and Cross-Arm Replacements -- Poles and cross-arms that are identified during routine or special aerial inspections or ground-based inspections, are designated for replacement on special projects.

f. Substation component inspections are performed on a monthly basis for each of the Oncor substation facilities. Additional "off-cycle" inspections may occur during construction or system operation activities.

3. Transmission Lines within Fifty Miles of the Texas Coast

Oncor Electric Delivery currently does not own infrastructure in the immediate Gulf Coast area; however, Oncor's network is maintained to meet or exceed all required design standards as prescribed by the National Electric Safety Code (NESC) for those areas in which it operates. In addition, as components of the infrastructure are repaired or replaced, they are done so at the current NESC standards.

Attachments:
Oncor Electric Delivery Vegetation Management Guidelines – Electric Distribution, Revised May, 16, 2007, 8 pages

Oncor Electric Delivery Vegetation Management Guidelines – Electric Transmission, 7 pages

The following Vegetation Management Guidelines are internal Oncor Electric Delivery documents that should not be distributed externally without permission of the T & D VM Program Manager, Maintenance Strategy.

I have read the contents of this document and understand that I am required to perform my job in accordance with these Guidelines.

NAME: _____

SIGNATURE: _____

COMPANY: _____

DATE: _____

DOCUMENT TITLE: _____

Oncor Electric Delivery

VEGETATION MANAGEMENT GUIDELINES

ELECTRIC DISTRIBUTION

Vegetation Management is essential for providing safe and reliable energy delivery, preventing damage to equipment, avoiding access impairment and to uphold the intended usage of the utility space.

A) **Methods & Procedures** - .

1) **Tree Pruning** - A method of pruning hereafter termed "lateral pruning" is the guideline method of pruning for line clearance on all Oncor Electric Delivery (Company) property and facilities, including overhead distribution lines. Lateral trimming is a specialized form of natural pruning developed by the National Arborist Association and endorsed by the International Society of Arboriculture, the Texas Forest Service and Dr. Alex Shigo in his booklet "*Pruning Trees Near Electric Utility Lines*". It is defined as a combination of techniques including: collar cutting, drop crotching, and directional trimming. Proper use of lateral trimming will provide effective line clearance and direct tree growth away from electrical conductors while maintaining regard for the health and natural condition of the trees.

   The following guidelines shall apply to pruning:

   a) Tree branches shall be removed in such a manner so as not to cause damage to other parts of the tree or to other plants or property. A pruning cut that removes a branch at its point of origin shall be made close to the trunk or parent limb, without cutting into the branch bark ridge or collar, or leaving a stub. ANSI A-300 5.3.2

   b) It is recommended that not more than 25 percent of the foliage of a branch or limb should be removed when it is cut back to a lateral. That lateral should be large enough to assume apical dominance. ANSI A-300 5.5.4

   c) Trees growing next to, into or toward facility / utility spaces should be pruned by reducing branches to laterals to direct growth away from the utility space or by removing entire branches. Branches that, when cut, will produce water sprouts that would grow into facilities and/or utility space should be removed. ANSI A-300 5.9.2.1.4

   d) Drop crotching is used to remove large branches in the crown of a tree without creating excessive wounding. A minimum number of pruning cuts should be made to accomplish the purpose of utility pruning. The natural structure of the tree should be considered. ANSI A-300 5.9.2.1.2

e) Branches should be cut to laterals or the parent branch and not at a pre-established clearing limit. If clearance limits are established, pruning cuts should be made at laterals or parent branches outside the specified clearance zone. ANSI A-300 5.9.2.1.5

f) When pruning in remote/rural locations using mechanical methods, cuts should be made close to the main stem, outside the branch bark ridge and branch collar. Precautions should be taken to avoid stripping or tearing of bark or excessive wounding. ANSI A-300 5.9.2.2

g) Equipment and work practices that damage living tissue and bark beyond the scope of the work should be avoided. ANSI A-300 5.2.1

h) Climbing spurs shall not be used when climbing and pruning trees.

Exceptions:

- When limbs are more than throw line distance apart and there is no other means of climbing the tree;
- When the bark is thick enough to prevent damage to cambium;
- In remote or rural utility rights-of- way. ANSI A-300 5.2.2

On tree removals, climbing spurs shall have gaffs of the type and length that are compatible for the tree being climbed. ANSI Z133.1 9.5.2

i.) In the Oncor service area where oak wilt centers have been identified, control and sanitation methods should be implemented. These include sanitizing equipment and painting pruning cuts. All work on oak species in these areas will follow Texas Forest Service recommendations in these instances.

- Wound treatments should not be used to cover wounds or pruning cuts, except when recommended for disease, insect, mistletoe, or sprout control, or for cosmetic reasons. ANSI A-300 5.4.1

j.) Topping and lion's tailing shall be considered unacceptable pruning practices for trees. ANSI A-300 5.5.7

2) **Tree Removals** -There are several conditions which would make routine pruning an undesirable means of dealing with specific trees. Trees, which meet one or more of the following conditions, should receive consideration for removal.

(a) Special consideration should be given to fast growing species including, but not limited to willow, cottonwood, chinaberry, hackberry, pine, sweetgum and sycamore growing directly

beneath conductors. These trees often require either frequent or excessive pruning to maintain adequate clearance.

(b) Dead or dying trees which may become a definite hazard to Company facilities, including off right-of-way trees.

(c) A tree where more than 25% of the existing foliage will have to be removed within a single growing season to provide adequate clearance or which will be left extremely unsightly after pruning. ANSI A-300 5.5.3

(d) Small volunteer species which due to location will never be allowed to reach their mature height or full potential as a landscape or shade tree.

(e) A tree for which adequate clearance from Company facilities is not possible or obtainable.

(f) If a tree can be removed as quickly as it can be trimmed and removal is cost-effective.

(g) Removals should be prioritized based on voltage and number of consumers affected. There should be greater emphasis placed on removals on the main portion of a feeder between the substation and the first isolating device; there should be no removals on service drops.

(h) Consumers should always be encouraged to select the correct tree utilizing the Oncor Electric Delivery document, *Plan before you plant*.

(i) When trees are removed, proper methods shall be employed to assure safety to public or Company facilities. Stumps should be cut as low to the ground level as possible, not to exceed 2 inches in height.

(j) Least Cost Method – Consideration should always be given to alternative methods such as mowing or the use of other specialized equipment to reduce overall cost of a job.

3) **Herbicide Use** - Where applicable, herbicides will be used for vegetation management on Distribution rights-of-way. All work will be performed according to federal, state, and local laws and regulations. All products must be used consistent with their labels. The contractor performing the work will be responsible for the storage, application, record keeping, and disposal of herbicides and related products. Oncor shall approve all herbicides, mixes, rates, and application methods. Generally, there are 3 recommended methods of herbicide application, Low Volume (LV) Basal, Foliage and Bare Ground application.

a). The following conditions apply to LV Basal applications:

1. All crews must have sufficient application equipment and chemical mix to perform necessary work. This includes specialty wands and tips to perform work correctly.
2. All contractor personnel must be qualified in the use of the Low Volume application techniques through a documented training program.
3. Susceptible woody plants with stems less than 6 inches in diameter and heights to just below the lowest conductor should be treated utilizing this method. Treated plants should not exceed the height of the lowest conductor. See product label for additional information.
4. Susceptible woody plants that have had the top portion removed so that none of the remaining tree could contact a conductor nor become a hazard can be treated utilizing this method.
5. Small susceptible volunteer species, which due to location will never be allowed to reach their mature height or full potential as a landscape or shade tree, should be treated utilizing this method.
6. Consideration should be given to applications in urban areas, especially during the dormant or winter season.
7. Vines species can be treated with this mixture by removing at least a 1 foot portion of the vine and completely treating the remaining portion exiting the ground as a basal bark treatment. The upper portion of the cut vine should be left on Company facilities to dry out at a natural rate. (Refer to: B) Maintenance Clearances – 3), for more information about vines]
8. This mix is also applicable as a Cut Stump Treatment to control the resprouting of cut stumps (removals) of susceptible species. Generally, these are all hand cut, hardwood stumps.

b). Scope of Work documents for foliage applications will be detailed toward the specific work activity and target species by Oncor for each individual activity type. These details may be modified during the season of application and involve specialized equipment for the application. Vegetation Management will retain, and make available, those specific documents at the main office, or appropriate field offices, for review.

c). Scope of Work documents for bare ground application will be detailed toward the specific work activity ground subs, MAT Stations and other similar locations and facilities where vegetation must be maintained to keep a bare ground or rocked condition, for each individual activity type. These details may be modified at the start of the application season. Vegetation Management will retain, and make available, those specific documents at the main office, or appropriate field offices, for review.

B) **Distribution Work Activities**

1) **Maintenance** - Comprehensive circuit maintenance will be performed using the benchmark feeder approach, by a bid process or by time & material. The goal of this approach will be to attain sufficient clearance for a period of time through the use of pruning, removals and appropriate herbicide applications.

   Refusals - In accordance with applicable tariffs, statutes and contracts, line clearance companies, Oncor and its representatives will make every effort and take appropriate action to overcome customer or property owner obstruction of work activities.

2) **Reactive** - Contractor will be responsible for scheduling normal reactive work and returning documentation to Oncor within 10 business days of issuance. Reactive work will be paid on a time and material basis. All efforts will be made by Oncor and the Contractor to reduce this type of work.

3) **Storms** - Initial crew response from contractor is expected within one (1) hour of notification from Oncor. If a storm event occurs on a benchmarked or bid process feeder at any time from when the price is established through completion, the work to restore service will be paid on a time and material basis. Following the storm, the feeder will be reevaluated and assessed with the worked performed for storm restoration adjusted from the original price.

   a). Anytime a LIGHTS OUT ticket is dispatched and worked, the Contractor must notify the Dispatcher, Service Center or other group issuing the ticket, 30 minutes before final work is completed. This insures that Oncor restoration personnel will be able to reestablish service in a timely manner.

4) **Capital Work (WR - Work Requested for Associated Construction Activities)**

When additions are made to the Oncor Electric distribution system, adequate tree-to-conductor clearance will be obtained prior to construction. Negotiations must be conducted and agreements formed between Oncor Electric Delivery PMDS representatives, the retail consumer requesting the line extension and involved property owners. Vegetation Management staff and line clearance contractors will be available to provide accurate cost estimates including firm price for CIAC collectable jobs. VM Contractors will oversee resource scheduling for all VM WR related activities. Information related to specific requirements for new construction can be found in the Oncor Electric Delivery booklet, *ROW Clearing Standards for Line Construction.*

a). **Assignment** - Crews will be available for WR work. Oncor will assist in prioritizing WR work to ensure timely response. PMDS is responsible for obtaining permission to prune on WR work involving new facilities only. PMDS may request a firm price for WR using the WR Pricing Sheet. Billing instructions for firm price jobs are described in VM Timesheet Codes and Billing Instructions.

b). **Methods** - All work will be in accordance with and adhere to all guidelines and practices described in the Oncor Electric Delivery Booklet, *ROW Clearing Standards for Line Construction.*

C.) **Maintenance Clearances**

Only a qualified line clearance arborist or line clearance arborist trainee shall be assigned to line clearance work in accordance with ANSI Z133.1, 29 CFR 1910.331 – 335, 29 CFR 1910.268 or 29 CFR 1910.269. ANSI A-300 5.9.1.2

1) The required tree-to-conductor clearance for any specific type of overhead line is not necessarily measured in distance from the conductor, as much as it is in effectiveness in preventing interruptions under normal operating conditions and cost effectiveness. These conditions include normal tree growth and structure, the combined movement of trees and conductors under adverse weather conditions, voltage, and sagging of conductors at elevated temperatures. Minimum clearances at time of pruning should be in the targeted ten (10) foot range across the system on all primary and non insulated secondary. Single neutral wires and bundled secondary should have approximately 4 (four) - 5 (five) feet of clearance from the conductor. In no case will clearances from a single neutral or wrapped secondary conductor supersede the clearance from primary and non insulated secondary. Trees should be pruned to retain the clearance and pattern that was secured during the initial construction or last maintenance pruning. If past pruning pattern does not meet these minimum clearance specifications, the clearances must be improved to the minimum guidelines.

2) For insulated street light conductor, a minimum clearance of three (3) feet from the conductor should be obtained.

3) To eliminate fire and climbing hazards, trees, vines, brush, etc. on or around poles, guy wires and other company facilities, should be cut and/or sprayed. A one (1) foot gap will be cut from vines around a pole and then chemically treat the basal stems of the vines. Where pedestrian or public activity may exist, remove vines from eight (8) feet above ground line down to near the base of the pole and chemically treat the basal stems of the vines. If vines have entangled any conductor or energized equipment area sufficiently thick, then the Contractor will notify the appropriate District Operations personnel to review if a vine still poses a hazard.

4) Limbs overhanging primary conductors should be removed. If conditions prevent the removal of all overhanging limbs, care should be taken to lighten or shorten remaining overhanging limbs to a height of at least 10 feet above conductor.

At line crossings, railroad crossings and limited access highway crossings, the crossing span and the adjoining span on each side of the crossing should be kept free from overhanging or decayed trees or limbs which otherwise might fall into the line. It is important to keep the conductors clear to avoid arcing or mechanical damage and to avoid grounding, short circuits or crosses between circuits. (NESC Handbook, 5th Edition, 2002, Section 21, Rule 218)

5) Service Drops - Pruning trees along or near the lower-voltage overhead service drop, outside the utility easement, is the responsibility of the end use customer. Oncor installs or re-installs overhead service drops only after the consumer has provided adequate space for the service drop. During restoration activity, Oncor may cut or move debris to repair the service drop to a consumer and that debris will be left on the property.

Other References Cited:

ANSI A300 (Part 1) 2001 Pruning *Tree Care Operations – Tree, Shrub, and Other Woody Plant Maintenance - Standard Practices (Pruning)*
ANSI Z133.1 - 2000 *Arborilogical Operations – Pruning, Repairing, Maintaining, and Removing Trees, and Cutting Brush - Safety Requirements*
Oncor Electric Delivery VM WR Assignment Sheet
Oncor Electric Delivery *ROW Clearing Standards for Line Construction*, ©2004
Oncor Electric Delivery *Plan before you plant*, ©2004, Tree Illustrations ©2000

The following Vegetation Management Guidelines are internal Oncor Electric Delivery documents that should not be distributed externally without permission of the VM Manager.

I have read the contents of this document and understand that I am required to perform my job in accordance with these Guidelines.

NAME: _____

SIGNATURE: _____

COMPANY: _____

DATE: _____

DOCUMENT TITLE: _____

Oncor Electric Delivery

VEGETATION MANAGEMENT GUIDELINES

ELECTRIC TRANSMISSION

Vegetation Management is essential for providing safe and reliable energy delivery, preventing damage to equipment, avoiding access impairment and to uphold the intended usage of the utility space.

A) **Methods & Procedures** -.

The location, conditions and nature of the Oncor Electric Delivery (Company) Transmission system requires a variety of VM methods. Any right-of-way may require one or more of the described methods.

1) **Tree Pruning** - A method of pruning hereafter termed "lateral pruning" is the guideline method of pruning for line clearance on all Company property and facilities, including overhead transmission lines. Lateral trimming is a specialized form of natural pruning developed by the National Arborist Association and endorsed by the International Society of Arboriculture, the Texas Forest Service and Dr. Alex Shigo in his booklet "*Pruning Trees Near Electric Utility Lines*". It is defined as a combination of techniques including: collar cutting, drop crotching, and directional trimming. Proper use of lateral trimming will provide effective line clearance and direct tree growth away from electrical conductors while maintaining regard for the health and natural condition of the trees.

   The following guidelines shall apply to pruning:

   a) Tree branches shall be removed in such a manner so as not to cause damage to other parts of the tree or to other plants or property. A pruning cut that removes a branch at its point of origin shall be made close to the trunk or parent limb, without cutting into the branch bark ridge or collar, or leaving a stub. ANSI A-300 5.3.2

   b) It is recommended that not more than 25 percent of the foliage of a branch or limb should be removed when it is cut back to a lateral. That lateral should be large enough to assume apical dominance. ANSI A-300 5.5.4

   c) Trees growing next to, into or toward facility/utility spaces should be pruned by reducing branches to laterals to direct growth away from the utility space or by removing entire branches. Branches that, when cut, will produce water sprouts that would grow into facilities and/or utility space should be removed. ANSI A-300 5.9.2.1.4

d) Drop crotching is used to remove large branches in the crown of a tree without creating excessive wounding. A minimum number of pruning cuts should be made to accomplish the purpose of facility/utility pruning. The natural structure of the tree should be considered. ANSI A-300 5.9.2.1.2

e) Branches should be cut to laterals or the parent branch and not at a pre-established clearing limit. If clearance limits are established, pruning cuts should be made at laterals or parent branches outside the specified clearance zone. ANSI A-300 5.9.2.1.5

f) When pruning in remote/rural locations using mechanical methods cuts should be made close to the main stem, outside the branch bark ridge and branch collar. Precautions should be taken to avoid stripping or tearing of bark or excessive wounding. ANSI A-300 5.9.2.2

g) Equipment and work practices that damage living tissue and bark beyond the scope of the work should be avoided. ANSI A-300 5.2.1

h) Climbing spurs shall not be used when climbing and pruning trees.

Exceptions:

- When limbs are more than throw line distance apart and there is no other means of climbing the tree;
- When the bark is thick enough to prevent damage to cambium;
- In remote or rural utility rights-of- way. ANSI A-300 5.2.2

On tree removals, climbing spurs shall have gaffs of the type and length that are compatible for the tree being climbed. ANSI Z-133.1 9.5.2

i.) In Oncor Electric Delivery Service Area counties where oak wilt centers have been identified control and sanitation methods should be implemented. These include sanitizing equipment and painting pruning cuts. All work on oak species in these areas will follow Texas Forest Service recommendations in these instances.

- Wound treatments should not be used to cover wounds or pruning cuts, except when recommended for disease, insect, mistletoe, or sprout control, or for cosmetic reasons. ANSI A-300 5.4.1

j.) Topping and lion's tailing shall be considered unacceptable pruning practices for trees. ANSI A-300 5.5.7

2) **Tree Removals** - Every effort should be made to remove trees directly under electric transmission facilities and restore the rights-of-way to its original condition, especially on any fee owned property. In situations where a cleared ROW is not achievable, as with easement rights properties, there may still be conditions which require consideration of individual trees for removal.

   (a) Special consideration should be given to fast growing species including, but not limited to willow, cottonwood, chinaberry, hackberry, pine, sweetgum, sycamore growing directly beneath conductors. These trees often require either frequent or excessive pruning to maintain adequate clearance.

   (b) Dead or dying trees which may become a definite hazard to Oncor facilities, including off rights-of-way trees. Debris generated from dead or dying trees should be left on the property.

   (c) A tree where more than 25% of the existing foliage will have to be removed within a single growing season to provide adequate clearance or which will be left extremely unsightly after pruning. ANSI A-300 5.5.3

   (d) Small volunteer species which due to location will never be allowed to reach their mature height or full potential as a landscape or shade tree.

   (e) A tree for which adequate clearance from Oncor facilities is not possible or obtainable.

   (f) If a tree can be removed as quickly as it can be trimmed and removal is cost-effective.

   (g) Property owners should be encouraged to remove tall growing species and utilize land management practices that encourage low growing species.

3) **Herbicide Use** - Where applicable, herbicides will be used for vegetation management on Transmission rights-of-way. All work will be performed according to federal, state, and local laws and regulations. All products must be used consistent with their labels. The contractor performing the work will be responsible for the storage, application, record keeping, and disposal of herbicides and related products. Oncor – Vegetation Management shall approve all herbicides, mixes, rates, and application methods. Generally, there are 3 recommended methods of herbicide application: Low Volume (LV) Basal for low stem per acre densities, Foliage applied for higher stem per acre densities and Bare Ground application in substation or rocked areas.

4) **Grass Mowing**

Grass mowing would be performed on any fee owned rights-of-way or facility involving municipal code enforcement or other health and safety mandates to keep all vegetation at or below a specific height. This would include utilizing appropriate equipment and following all applicable safety rules.

5) **ROW Shredding or Mowing**

Specialized mowing targeted at clearing trees, brush, vines and other vegetation from either a fee owned rights-of-way or easement rights situation. Equipment used will vary with targeted species and will follow all applicable safety rules.

6) **Other Specialized Equipment**

Other specialized equipment shall be utilized to maintain Oncor Electric Delivery Transmission facilities on a site specific basis and following all applicable safety rules.

B) **Maintenance Clearances**

Only a qualified line clearance arborist or line clearance arborist trainee shall be assigned to line clearance work in accordance with ANSI Z133.1, 29 CFR 1910.331 – 335, 29 CFR 1910.268 or 29 CFR 1910.269. ANSI A-300 5.9.1.2

1) Designated Rights-Of-Way Widths - When performing transmission rights-of-way maintenance on lines with designated widths, the contractor is responsible for maintaining the full width of the rights-of-way.

2) Non-Designated Rights-Of-Way Widths - On rights-of-way without designated widths, maintenance clearing should be performed to retain the clearance and pattern that was secured during the initial clearing or the last maintenance cycle. If the former clearance is not adequate to prevent trees from endangering conductors and/or facilities, the clearance must be improved to meet minimum guidelines.

3) Selective Cut Rights-Of-Way - Rights-of-way maintenance on easements designated as selective cut shall be maintained as stated in TXU Electric Delivery Transmission Standards, Construction Specification for Transmission Line ROW Clearing, 4.4.

4) Pruning

a). Rights-Of-Way Side Pruning - When performing side pruning, all trees shall be trimmed to the full width of the rights-of-way.

b). Residential Pruning - Non rights-of-way transmission pruning shall be performed so as to prevent all tree-related interruptions. The minimum clearance guidelines for this type of pruning are as follows:

Voltage	Ft.
69 kV	15
138 kV	15
345 kV	20

Clearances should be measured from point of maximum conductor sag.

5) Rights-Of-Way Brush Shredding - In areas where herbicide use is not practical and mechanical brush shredding or mowing is the preferred method for rights-of-way vegetation maintenance, all brush and stump height should be as low as possible, two inches (2") maximum.

C) **Transmission Work Activities**

1) **Maintenance** - Work will be identified and scheduled with input from Oncor Transmission Division personnel and Vegetation Management in scheduled meetings during the year.

2) **Reactive** - Contractor will be responsible for scheduling normal reactive work in a timely manner. All reactive work should be authorized using the Transmission Priority ROW Work Request Form, which should be returned to Oncor Electric Delivery when work is completed.

3) **Special Projects** – Projects may be assigned as the need arises.

- Fences, Gates & Culverts - When requested and approved by a Oncor Electric Delivery representative, Contractor shall be responsible for installation of new fences, gates and culverts. Contractor will be compensated at the approved time and material rates. All existing fences, gates and culverts on rights-of-way shall be left as found or in better condition than prior to maintenance activity.

4) **Transmission Notification** - Contractors are responsible for notification of Region transmission dispatchers when crews are working on transmission rights-of-way.

Other References Cited:
Oncor ED Transmission Priority ROW Work Request, Rev 06-01-2004
Const Spec for Transmission ROW Clearing, 4.4, Rev 03-30-1992
ANSI A300 (Part 1) 2001 Pruning *Tree Care Operations – Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices (Pruning)*
ANSI Z133.1 - 2000 *Arborilogical Operations – Pruning, Repairing, Maintaining, and Removing Trees, and Cutting Brush - Safety Requirements*